7.0 GLOSSARY

AA: Atomic Absorption (Spectrometry). An instrument used to measure concentrations of metals in water, biological and soil samples (as extracts and digests). It is used in the less sensitive flame mode or the more sensitive furnace mode. It is adjusted to be selective for one single element at a time, as opposed to ICP.

Acceptable Criteria: specified limits placed on characteristics of an item, process, or service defined in requirement documents. (ASQC)

Accreditation: the process by which an agency or organization evaluates and recognizes a program of study or an institution as meeting certain predetermined qualifications or standards, thereby accrediting the laboratory. In the context of the National Environmental Laboratory Accreditation Program (NELAP), this process is a voluntary one. (NELAC)

Accrediting Authority: the agency having responsibility and accountability for environmental laboratory accreditation and who grants accreditation. For the purposes of NELAC, this is EPA, other federal agencies, or the state. (NELAC)

Accuracy: the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components which are due to sampling and analytical operations; a data quality indicator. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Analytical Reagent (AR) Grade: designation for the high purity of certain chemical reagents and solvents given the American Chemical Society. (Quality Systems)

Annular Space: The open space formed between the bore hole and the well casing. (i.e. outside the well casing)

Aquiclude: A geologic formation which may contain ground water but is incapable of transmitting significant quantities under normal hydraulic gradients.

Aquitard: A geologic formation of low permeability which can store or transmit ground water in significant quantities but typically at a very slow rate.

Assessor Body: the organization that actually executes the accreditation process, i.e., receives and reviews accreditation applications, reviews QA documents, reviews proficiency testing results, surveys the site, etc., whether EPA, the state, or contracted private party. (NELAP)

Audit: A systematic check to determine the quality of operation of some function or activity. Audits may be of two basic types: (1) performance audits in which quantitative or qualitative data are independently obtained for comparison with routinely obtained data in a measurement system, or (2) systems audits of a qualitative nature that consist of an on site review of a laboratory's quality assurance system and physical facilities for sampling, calibration, and measurement.

Background Sample: A sample that is taken from the general area where the sampling is being performed but remote from the actual sampling site. This sample should possess the same matrix characteristics as the actual samples, but be free of analytes. (Sometimes contain significant amounts of analyte, e.g., Pb in soil).

Bailer: A hollow, cylindrical device used to collect water samples. A ball valve allows water to enter from the bottom as the bailer is lowered, then prevents its release as the bailer is raised, thereby collecting the sample at desired depth.

Batch: environmental samples which are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents, with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. The size of a batch can range from one environmental sample to 20 environmental samples. All environmental samples in the batch must be of the same matrix as defined by NELAC. The resulting extracts, digestates or concentrates may be combined into an analytical batch. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples. (Quality Systems)

Bentonite: A sedimentary rock largely comprised of clay minerals that have a great ability to absorb water and swell in volume.

Bias: The difference between the mean measurement and the reference or true value. Also see accuracy.

Bladder Pump: A device used to sample ground water. The pump uses a bag made of fluorocarbon material in order to prevent contamination of the sample and loss of volatile components.

Blank: a sample that has not been exposed to the analyzed sample stream in order to monitor contamination during sampling, transport, storage or analysis. The blank is subjected to the usually analytical and measurement process to establish a zero baseline or background value and is sometimes used to adjust or correct routine analytical results. (ASQC, Definitions of Environmental Quality Assurance Terms, 1996)

Blind Sample: a subsample for analysis with a composition known to the submitter. The analyst/laboratory may know the identity of the sample but not its composition. It is used to test the analyst's or laboratory's proficiency in the execution of the measurement process.

Borehole Geophysics (Geophysical Borehole Logging): A general term that encompasses all techniques in which a sensing device is lowered into a borehole for the purpose of characterizing the associated geologic formations and their fluids. The results can be interpreted to determine lithology, geometry resistivity, bulk density, porosity, permeability, and moisture content and to define the source, movement, and physical/chemical characteristics of ground water.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act, PL 96-510, December 1980.

Calibrate: to determine, by measurement or comparison with a standard, the correct value of each scale reading on a meter or other devise, or the correct value for each setting of a control knob. The levels of the applied calibration standard should bracket the range of planned or expected sample measurements.

Calibration: the set of operations which establish, under specified conditions, the relationship between values indicated by a measuring instrument or measuring system, or values represented by a material measure, and the corresponding known values of a measurand. (VIM - 6.13)

Calibration Curve: the graphical relationship between the known values, such as concentrations, of a series of calibration standards and their instrument response.

Calibration Method: defined technical procedure for performing a calibration.

Calibration Standard: a solution prepared from the primary dilution standard solution or stock standard solutions and the internal standards and surrogate analytes. The Calibration solutions are used to calibrate the instrument response with respect to analyte concentration. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Certified Reference Material (CRM): a reference material one or more of whose property values are certified by a technically valid procedure, accompanied by or traceable to a certificate or other documentation which is issued by a certifying body. (ISO Guide 30 - 2.2)

CFR: Code of Federal Regulation

Chain of Custody: an unbroken trail of accountability that insures the physical security of samples, data and records.

Chromatogram: A graph representing the signal output of an instrument (GC or HPLC) which can identify organic chemicals by peak retention time (RT) and quantitate by peak size.

CLP: EPA Contract Laboratory Program

Coefficient of Variation: A measure of relative dispersion. It is equal to the standard deviation divided by the mean and multiplied by 100 to give a percentage value. Also called relative standard deviation (RSD).

Co-located Sample (sometimes written collocated or collocated): Independent samples collected in such a manner that they are equally representative of the variable(s) of interest at a given point in space and time. Examples of collocated samples include: samples from two parallel samplers at the same location or two water samples collected at essentially the same time and from the same point in the lake. Results of collocated samples indicate the reproducibility (precision) of the sampling and analytical technique.

Comparability: A measure of the confidence with which one data set can be compared to another.

Completeness: A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct and normal circumstances.

Compromised Samples: those samples which were improperly sampled, or with insufficient documentation (chain of custody and other sample records and/or labels), improper preservation and/or containers were used, or the holding time has been exceeded. Under normal conditions compromised samples are not analyzed. If emergency situations require analysis, the results must be appropriately qualified.

Concentration: The amount of chemical (analyte) present per amount of sample. For trace analyses, usually expressed as mg/L or ug/L for aqueous samples and mg/kg or ug/kg.

Cone of Depression: The cone-shaped lowering of the water table caused by pumping. Also referred to as drawdown.

Confined Aquifer: An aquifer under greater than atmospheric pressure bounded above and below by impermeable layer or layers of distinctly lower permeability (aquitard) than the aquifer itself.

Confirmation: verification of the presence of a component through the use of an analytical technique based on a different scientific principle from the original method. These may include:

Second column confirmation
Alternate wavelength
Derivatization
Mass spectral interpretation
Alternative detectors or
Additional cleanup procedures.

Corrective Action: action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence. (ISO 8402)

Coulson-GC: GC with a detector selective for halogenated organics, often used with the purge/trap technique for VOAs.

Data Reduction: the process of transforming raw data by arithmetic or statistical calculations, standard curves, concentration factors, etc., and collation into a more useful form.

Data Quality Objectives (DQOs): A statement of the precise data, the manner in which such data may be combined, and the acceptable uncertainty in those data in order to resolve an environmental problem or condition. This may also include the criteria or specifications needed to design a study that resolves the question or decision addressed by the DQO.

Data Audit: a qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality (i.e., that they meet specified acceptance criteria.

Data Quality: The totality of features and characteristics of data that bears on its ability to satisfy a given purpose. The characteristics of major importance are accuracy, precision, existence of contamination, limit of detection completeness, representativeness, and comparability.

Data Validation: A systematic effort to review data to identify any outliers or errors and thereby cause deletion or flagging of suspect values to assure the validity of the data to the user. This auditing process may be done by manual and/or automated methods.

Depth to Bottom: Distance from fixed point, usually the top of the well casing, to the bottom of the well screen intake.

Depth to Water: Distance from a fixed point, usually the top of the well casing, to the top of the water surface.

Digestion: The process of extracting metals from a solid sample by heating with nitric acid.

Dioxin: Usually refers to 2,3,7,8-tetrachloro-p-dioxin (TCDD).

Dispersivity: Ability of a contaminant to disperse within the ground water due to molecular diffusion and mechanical mixing.

Document Control: the act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed. (ASQC, Definitions of Environmental Quality Assurance Terms, 1996)

Double Blind Sample: a sample submitted to evaluate performance with concentration and identity unknown to the analyst.

Downgradient: Direction of decreasing hydrostatic pressure.

Drilling Mud: Fluids which are used during the drilling of a borehole or well to wash soil cuttings away from the drill bit and adjust the specific gravity of the liquid in the borehole so that the sides of the hole do not cave in prior to installation of a casing.

Duplicate Analyses: the analyses or measurements of the variable of interest performed identically on two subsamples of the same sample. The results from duplicate analyses are used to evaluate analytical or measurement precision but not the precision of sampling, preservation or storage internal to the laboratory.

EC/GC: Electron-Capture Gas Chromatography. GC with a detector selective for halogenated organic chemicals (usually chlorinated hydrocarbon pesticides).

Elevation: Height relative to mean sea level.

Environmentally-Related Measurements: A term used to describe essentially all field and laboratory investigations that generate data involving the measurement of chemical, physical, or biological parameters in the environment; determining the presence or absence of priority pollutants in waste streams; health and ecological effect studies; clinical and epidemiological investigations; engineering and process evaluations; studies involving laboratory simulation of environmental events; and studies or measurements on pollutant transport, including diffusion models.

EP: EPA Extraction Procedure Toxicity Method: 40 CFR App. II, Apr. 8, 1983.

Equipment Blank: A sample that is made by collecting the final solvent rinsate used to rinse the sampling equipment.

Field Duplicate: Refers either to two separate samples collected from the same location in the field or to a single sample split into two portions in the field, preserved, transported, stored, prepared and analyzed identically, Results indicate the reproducibility (precision) of all the processes described above and analytical techniques.

Field Matrix Spike: A sample created by spiking target analytes into a portion of a sample in the field at the point of sample acquisition. This sample provides information on the target analyte stability and loss due to volatility after collection and during transport, storage, sample preparation and analysis.

GC: Gas Chromatograph - An instrument used to qualitatively and quantitatively identify volatile and semivolatile organic chemicals in a sample extract.

GC/MS: Gas Chromatography/Mass Spectrometer. GC with a mass spectrometric detector that provides almost absolute identification by taking a "fingerprint" (mass spectrum) of each organic chemical present in the sample.

Hall-GC: GC with a detector selective for halogenated organics, often used with the purge/trap technique for VOAs.

Holding Times (Maximum Allowable Holding Times): the maximum times that samples may be held prior to analysis and still be considered valid. (40 CFR Part 136).

HPLC: High Performance Liquid Chromatography. A chromatograph which is used to qualitatively and quantitatively identify organic chemicals, particularly those which are not amenable to GC techniques because of thermal instability, polarity or nonvolatility.

Hydraulic Conductivity: a coefficient of proportionality which describes the rate at which a fluid can move through a permeable medium such as an aquifer. It is a function of the media and of the fluid flowing through it.

ICP (ICPAES): Inductively Coupled Plasma Atomic Emission Spectroscopy. An instrument used to measure concentrations of metals in water samples, extracts and digests. The instruments are either simultaneous or sequential and are capable of measuring the presence and amount of a variety of metals at one time.

Initial Demonstration of Analytical Capability: procedure to establish the ability to generate acceptable accuracy and precision which is included in many of the EPA's

analytical methods. In general the procedure includes the addition of a specified concentration of each analyte (using a QC check sample) in each of four separate aliquots of laboratory pure water. These are carried through the entire analytical procedure and the percentage recovery and the standard deviation are determined and compared to specified limits. (40 CFR Part 136).

Instrument Blank: a clean sample (e.g., distilled water) processed through the instrumental steps of the measurement process; used to determine instrument contamination. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Interface Probe: Instrument capable of detecting an immiscible organic layer floating on the surface of the water.

Internal Standard: a known amount of standard added to a test portion of a sample and carried through the entire measurement process as a reference for evaluating and controlling the precision and bias of the applied analytical method.

Intrinsic Permeability: relates to the relative ability of a porous medium to transmit liquid under a hydraulic gradient, and is independent of the liquid itself.

It is also expressed as the degree of agreement of a measurement (or an average of measurements of the same thing), X, with an accepted reference or true value, T, usually expressed as the difference between two values, X- T, or the difference as a percentage of the reference or true value, 100(X-T)/T, and sometimes expressed as a ratio, X/T. Accuracy is a measure of the bias in a system.

Laboratory Matrix Spike: A sample created by spiking target compounds into a portion of a sample when it is received in the laboratory. It provides information on the analytical accuracy of sample preparation and analysis and is the most common type of spiked sample. A lab matrix spike does not necessarily reflect the behavior of the field-collected target analyte, especially if the target analyte is not stable during shipping.

Laboratory: Body that calibrates and/or tests.

NOTES:

1. In cases where a laboratory forms part of an organization that carries out other activities besides calibration and testing, the term "laboratory" refers only to those parts of that organization that are involved in the calibration and testing process.

2. As used herein, the term "laboratory" refers to a body that carries out calibration or testing
   - at or from a permanent location,

- at or from a temporary facility, or
- in or from a mobile facility. (ISO 25)

Laboratory Control Sample (quality control sample): an uncontaminated sample matrix spiked with known amounts of analytes from a source independent of the calibration standards. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Laboratory Duplicate: Aliquots of a sample taken from the same container under laboratory conditions and processed and analyzed independently.

Leachate: A liquid including any suspended components in the liquid that has percolated through or drained from hazardous waste.

Legal Chain of Custody (COC): an unbroken trail of accountability that ensures the physical security of samples, data and records. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Limit of detection: Limit at which an analyte can be reported to be present at a specified confidence level.

Limit of quantitation: Limit at which the concentration of an analyte is reported at a specified confidence level.

Manager (however named): the individual designated as being responsible for the overall operation, all personnel, and the physical plant of the environmental laboratory. A supervisor may report to the manager. In some cases, the supervisor and the manager may be the same individual.

Matrix: The component or substrate which contains the analyte of interest. For purposes of batch determination, the following matrix types shall be used:

Drinking water:	Any aqueous sample that has been designated as a potable or potential potable water source.
Aqueous:	Any aqueous sample excluded from the definition of a water matrix or Saline/Estuarine source. Includes surface water, groundwater and effluents.
Saline/Estuarine:	Any aqueous sample from an ocean or estuary, or other salt water source such as the Great Salt Lake.

Non-aqueous liquid:	Any organic liquid with <15% settleable solids.
Biological Tissue:	Any sample of a biological origin such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origin.
Solids:	Includes soils, sediments, sludges and other matrices with >15% settleable solids.
Chemical Waste:	A product or by-product of an industrial process that results in a matrix not previously defined.
Air Samples:	Media used to retain the analyte of interest from an air sample such as sorbent tubes or summa canisters. Each medium shall be considered as a distinct matrix. (Quality Systems)

Matrix Spike (spiked sample, fortified sample): prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. Matrix spikes are used, for example, to determine the effect of the matrix on a method's recovery efficiency. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Matrix Spike Duplicate (spiked sample/fortified sample duplicate): a second replicate matrix spike is prepared in the laboratory and analyzed to obtain a measure of the precision of the recovery for each analyte. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

May: permitted, but not required (TRADE)

Median: The middle point in a set of measurements ranked by numerical value. Half of the numbers lie above and half below the median. If there is an even number of measurements, the medium is the mean of the two central measurements.

Method Blank: a clean sample processed simultaneously with and under the same conditions as samples containing an analyte of interest through all steps of the analytical procedures. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Method Detection Limit (Analytical Detection Limit): the minimum concentration of a substance (an analyte) that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte. (40 CFR Part 136 Appendix B).

Method Standard: The solvent is spiked with analytes of interest from an independent source to monitor the analytical method. These standards are used to document interference free recoveries.

Mounding: A phenomenon usually created by the recharge of ground water from a manmade structure into a permeable geologic material. Associated ground-water flow will be away from the manmade structure in all directions.

Must: denotes a requirement that must be met. (Random House College Dictionary)

Negative Control: measures taken to ensure that a test, its components, or the environment do not cause undesired effects, or produce incorrect test results.

NELAC: National Environmental Laboratory Accreditation Conference. A voluntary organization of state and federal environmental officials and interest groups purposed primarily to establish mutually acceptable standards for accrediting environmental laboratories. A subset of NELAP. (NELAC)

NELAP: the overall National Environmental Laboratory Accreditation Program of which NELAC is a part. (NELAC)

Octanol-Water Partition Coefficient: A coefficient representing the ratio of solubility of a compound in octanol to its solubility in water. As the octanol-water partition coefficient increases, water solubility decreases.

Organics: Most chemicals that contain the element carbon are organic chemicals or "organics". Organic chemicals can be synthetic or derived from natural sources. Pesticides and priority pollutants are examples of hazardous organics.

OVA: Organic Vapor Analyzer - A handheld air monitoring instrument which detects a wide range of organic vapors through flame ionization.

PAHs (PNAs): Polynuclear Aromatic Hydrocarbons. A class of hydrocarbons based on combinations of benzene rings. Also called PNAs (polynuclear aromatics).

Parameter: A constant or coefficient that describes some characteristic of a population (e.g., standard deviation, mean, regression coefficients). At times this term is used interchangeably with analyte.

PCBs: Polychlorinated Biphenyls, a class of chlorinated organic mixtures previously used as insulators in transformers. The four most common mixtures are called Aroclors 1242, 1248, 1254, and 1260. These designations represent the number of carbon atoms (12) and percent weight chlorine 42) for Arochlor 1242.

Performance Audit: the routine comparison of independently obtained quantitative measurement system data with routinely obtained data in order to evaluate the proficiency of an analyst or laboratory.

Performance Based Measurement System (PBMS): a set of processes wherein the data quality needs, mandates or limitations of a program or project are specified and serve as criteria for selecting appropriate methods to meet those needs in a cost-effective manner.

Phreatic Zone: See Saturated Zone

Piezometers: Generally a small diameter, non-pumping well used to measure the elevation of the water table or potentiometric surface.

Positive Control: measures taken to ensure that a test and/or its components are working properly and producing correct or expected results from positive test subjects.

Potentiometric Surface (Piezometric Surface): The surface that represents the level to which water from a given aquifer will rise by hydrostatic pressure. When the water-bearing zone is the uppermost unconfined aquifer, the potentiometric surface is identical to the water table.

Precision: the degree to which a set of observations or measurements of the same property, usually obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed as standard deviation, variance or range, in either absolute or relative terms. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Preservation: refrigeration and or reagents added at the time of sample collection to maintain the chemical and or biological integrity of the sample.

Proficiency Testing: Determination of the laboratory calibration or testing performance by means of interlaboratory comparisons. (ISO/IEC Guide 2 - 12.6, amended)

Proficiency Test Sample (PE): a sample, the composition of which is unknown to the analyst and is provided to test whether the analyst/laboratory can produce analytical results within specified performance limits. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Protocol: a detailed written procedure for field and/or laboratory operation (e.g., sampling, analysis) which must be strictly followed.

Pump Test: A test made by pumping a well for a period of time and observing the change in hydraulic head in adjacent wells. A pump test may be used to determine degree of

hydraulic interconnection between different water-bearing units as well as the recharge rate of a well.

Pure Reagent Water: shall be ASTM Type I or Type II water in which no target analytes or interferences are detected as required by the analytical method.

Purgeables: Those volatile organic chemicals which are best analyzed by purging from a sample matrix.

QA/QC: Quality Assurance/Quality Control

Quality Assurance: an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Quality Control: the overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Quality Control Sample: an uncontaminated sample matrix spiked with known amounts of analytes from a source independent from the calibration standards. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Quality Manual: A document stating the quality policy, quality system and quality practices of an organization. This may be also called a Quality Assurance Plan or a Quality Plan.

> NOTE - The quality manual may call up other documentation relating to the laboratory's quality arrangements.

Quality System: a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA and QC. (ANSI/ASQC E-41994)

Quality Assurance Project Plan: An orderly assembly of detailed and specific procedures by which an agency or laboratory delineates how it produces quality data for a specific project or measurement method. Sampling plans also should address quality assurance concerns for the sampling activities.

Quality Management Plan (QMP): It defines an organization's QA - related policies, criteria for and areas of application, and definition of roles, responsibilities, and authorities.

Range: the difference between the minimum and the maximum of a set of values.

RCRA: The federal Resource Conservation and Recovery Act, PL 94-590, October 1976.

Raw Data: any original factual information from a measurement activity or study recorded in a laboratory notebook, worksheets, records, memoranda, notes ,or exact copies thereof and that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic media, including dictated observations, and recorded data from automated instruments. If exact copies of raw data have been prepared (e.g., tapes which have been transcribed verbatim, data and verified accurate by signature), the exact copy or exact transcript may be submitted.

Reagent Blank (method reagent blank): a sample consisting of reagent(s), without the target analyte or sample matrix, introduced into the analytical procedure at the appropriate point and carried through all subsequent steps to determine the contribution of the reagents and of the involved analytical steps. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Reference Material: a material or substance one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or for assigning values to materials. (ISO Guide 30 - 2.1)

Reference Standard: a standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived. (VIM - 6.08)

Reference Toxicant: see D.2.1.a

Replicate Analyses: the measurements of the variable of interest performed identically on two or more subsamples of the same sample within a short time interval.

Representativeness: the degree to which data accurately and precisely represents a characteristic of a population, the variation of a parameter at a sampling point, or an environmental condition.

Requirement: a translation of the needs into a set of individual quantified or descriptive specifications for the characteristics of an entity in order to enable its realization and examination.

Sample Duplicate: two samples taken from and representative of the same population and carried through all steps of the sampling and analytical procedures in an identical manner. Duplicate samples are used to assess variance of the total method including sampling and analysis. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).
Sampling Spike: A compound that is not present in the environment added to the filter or sorbent bed to study the sampling efficiency.

Saturated Zone (Phreatic Zone): A subsurface zone in which the pore space is completely filled with water.

Seep: A spot where groundwater trickles out of the ground.
Significant Figures - Digits in a number that have some practical meaning. For a number with significant figures, all digits are certain except for the last digit, which may be in doubt.

Selectivity: (Analytical chemistry) the capability of a method or instrument to respond to a target substance or constituent in the presence of nontarget substances.

Sensitivity: the capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.

Shall: denotes a requirement that is mandatory whenever the criterion for conformance with the specification requires that there be no deviation. This does not prohibit the use of alternative approaches or methods for implementing the specification so long as the requirement is fulfilled. (*Style Manual for Preparation of Proposed American National Standards*, American National Standards Institute, eighth edition, March 1991).

Should: denotes a guideline or recommendation whenever noncompliance with the specification is permissible. (*Style Manual for Preparation of Proposed American National Standards*, American National Standards Institute, eighth edition, March 1991).

Slug Test: An aquifer test made by either pouring a small charge of water into a well or by withdrawing a slug of water from the well and monitoring the length of time the well requires to return to static water level conditions. This test is often employed to determine hydraulic conductivity.

Solvent Blank: A sample made by taking a portion of the solvent used to extract a sample.

Specific Conductance: Specific Conductance (or Electrical Conductivity) is a gross analytical test for the presence of inorganic chemicals.

Spike: a known mass of target analyte added to a blank sample or subsample; used to determine recovery efficiency or for other quality control purposes.

Split Sample: a homogenized sample divided into two portions, which are usually sent to different organizations or laboratories and subjected to the same environmental conditions and steps in the measurement process.

Standard Operating Procedures (SOPs): a written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Standard Reference Material (SRM): a certified reference material produced by the U.S. National Institute of Standards and Technology and characterized for absolute content, independent of analytical method.

Standard Deviation (s): a measure of the dispersion about the mean of the elements in a population.

Standing Water: groundwater standing in a well which is not being pumped.

STLC: Soluble Threshold Limit Concentration. As defined by the WET, the maximum leachable concentrations of chemicals allowed in a non-hazardous waste. See TTLC.

Supervisor (however named): the individual(s) designated as being responsible for a particular area or category of scientific analysis. This responsibility includes direct day-to-day supervision of technical employees, supply and instrument adequacy and upkeep, quality assurance/quality control duties and ascertaining that technical employees have the required balance of education, training and experience to perform the required analyses.

Surrogate: a substance with properties that mimic the analyte of interest. It is unlikely to be found in environment samples and is added to them for quality control purposes. (Glossary of Quality Assurance Terms, QAMS, 8/31/92).

Systems Audit (also Technical Systems Audit): a thorough, systematic on-site, qualitative review of the facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system.

Technical Analyst: the designated individual who performs the "hands-on" analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent Quality Controls to meet the required level of quality.

Test Method: defined technical procedure for performing a test.

Test: a technical operation that consists of the determination of one or more characteristics or performance of a given product, material, equipment, organism, physical phenomenon, process or service according to a specified procedure.

NOTE - The result of a test is normally recorded in a document sometimes called a test report or a test certificate. (ISO/IEC Guide 2 - 12.1, amended)

Testing Laboratory: laboratory that performs tests. (ISO/IEC Guide 2 - 12.4)

The media in which analytes are tested at ECL includes air, water, soil and solids. Water and soil matrices are the most commonly encountered matrices. Therefore in defining the matrices for the purpose of performing the required matrix spike and matrix spike duplicates these two matrix types, water and soil, are considered independent and all samples analyzed should be broadly classified into one of these two matrix types.

TOC: Total Organic Carbon (SW-846, Method 9060).

TOX: Total Organic Halogens (SW-846, Method 9020).

Total Quality Management (TQM): The process of applying quality management to all activities of the organization, including technical and administrative operations.

Traceability: the property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons. (VIM - 6.12)

Travel Blank (Trip Blank): A sample, usually purified (organic free) water, prepared in the laboratory, which is taken to the sampling site and then returned with the collected samples. Later analysis will eliminate any false positive results in the real samples arising from contamination during shipment. Also called Trip Blank. See also Trip Spike.

Trip Spike: A sample, usually water, to which a known amount of the chemical of interest is added in the lab before a sampling trip. Later analysis will eliminate any false negative results in the real samples arising from degradation during shipment. See also Travel Blank.

TTLC: Total Threshold Limit Concentration. As defined by the WET, the maximum total concentrations of chemicals allowed in a non-hazardous waste. See STLC.

Turbidity: refers to the decrease in transparency of the water due to suspended particles.

Unsaturated Zone: (Vadose Zone) - a subsurface zone above the water table in which the

soil pores of a porous medium are only partially filled with water.

Upgradient: direction of increasing hydrostatic pressure.

Vadose Zone: See Unsaturated Zone.

Validation: the process of substantiating specified performance criteria.

Verification: confirmation by examination and provision of evidence that specified requirements have been met.

NOTE - In connection with the management of measuring equipment, verification provides a means for checking that the deviations between values indicated by a measuring instrument and corresponding known values of a measured quantity are consistently smaller than the maximum allowable error defined in a standard, regulation or specification peculiar to the management of the measuring equipment.

The result of verification leads to a decision either to restore in service, to perform adjustments, or to repair, or to downgrade, or to declare obsolete. In all cases it is required that a written trace of the verification performed shall be kept on the measuring instrument's individual record.

VOA (VOC): Volatile Organic Analyses (Volatile Organic Carbon). A test for volatile organic chemicals by the purge and trap technique using GC with a halide-specific detector (e.g., Coulson or Hall for chlorinated, brominated or fluorinated volatile organics) or with GC/MS (for any volatile organic). Mainly used for trihalomethanes or industrial solvents in groundwater samples.

Volatile Constituents: solid or liquid compounds which are relatively unstable at standard temperature and pressure and undergo spontaneous phase change to a gaseous state. Vapor pressure is a measure of a compound's volatility in its pure phase. Henry's constant is measure of its volatility from aqueous solution.

Water Table: the water level surface below the ground at which the vadose zone ends and the phreatic zone begins. It is the level to which a well screened in the unconfined aquifer would fill with water.

Well Casing: rigid cylindrical material inserted into the well borehole.

Well Screen: the perforated section of the well casing.

Well Volume (V): volume of standing water in a well calculated as $V=(PI)*V^2*$(height of the water column)